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TITLE: PRINTER AND METHOD FOR TRANSFERRING PRINTER JOB DATA

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ABSTRACT:

PROBLEM TO BE SOLVED: To reduce development costs by dispensing with the development of an interfaces relying on each printing server.

SOLUTION: A printer having a printing server designates a loop back address regulated by TCP/IP and transfers print job data spooled in the print server to a print processing means.

* NOTICES *

1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention] This invention relates to the printer connected to a network. Especially this invention relates to the printer using TCP/IP which is a general-purpose network protocol.
[0002]
[Description of the Prior Art] Conventionally it connects with LAN built with Ethernet (trademark) (Ethernet (trademark)) etc., and the printer of the mold corresponding to the network which can be shared with two or more host computers is known. A host computer performs network communication between printers according to a predetermined network protocol, and sends into a printer the print job data outputted from a printer driver. There is an LPR protocol mounted for example, on TCP/IP in a network protocol for a host computer to send print job data into a printer.
[0003] In order to use a network efficiently in the environment where such a network printer is offered, it is common to prepare a printer server. After performing network communication between host computers, a printer server once sends out sequential print job data for print job data, after spooling to stores, such as a hard disk, reception and. As shown in drawing 3 , there are what is constituted independently of the printer exterior (henceforth "the printer server outside a printer"), and a thing (henceforth "the printer server in a printer") which the printer itself constitutes in that interior in this printer server.
[0004] By the method (this drawing (a)) by the printer server outside a printer, after being spooled to a printer server body, it will be transmitted to the printer further specified by the LPR protocol, and printing processing of the print job data transmitted by the LPR protocol from a host computer will be carried out.
[0005] On the other hand, by the method (this drawing (b)) by the printer server in a printer, after print job data are spooled to the printer server body in a printer, from there, through an internal interface, it will be directly transmitted to a printing processing circuit, and printing processing of them will be carried out.
[0006]
[Problem(s) to be Solved by the Invention] Whenever it developed the new print server outside a printer which should be introduced into a network printer environment, the interface between a print server body and an LPR client needed to be developed.
[0007] On the other hand, in the case of the print server in a printer, when the interface between a printer server body and a printing processing circuit needed to be developed and the highly efficient engine was newly developed for this reason, that interface itself had to be developed in connection with it.
[0008] Moreover, although it is desirable to realize with various protocols other than the LPR protocol on TCP/IP as for a print server, it is not realistic. [of being built so that it may correspond to all protocols, such as NetWare and Apple Talk,]
[0009] Then, this invention makes it the technical problem to abolish the time and effort of developing the interface depending on each print server, respectively.

[0010] More specifically, the technical problem of this invention is offering the print server in a printer which adopted as the communication link between a print server body and a printing processing circuit the LPR protocol which is a standard network protocol.
[0011]
[Means for Solving the Problem] This invention for solving the above-mentioned technical problem is specified as follows.
[0012] The summary of this invention is the printer equipped with the print server, and is a printer characterized by specifying the loopback address to which the print job data spooled to said print server are specified by IP, and transmitting to a printing processing means.
[0013] The 1st receiving means which more specifically receives the print job data transmitted from a host computer according to the 1st protocol, The print server which spools the print job data received with said 1st receiving means, The 1st transmitting means which transmits the print job data spooled to said print server according to the 2nd protocol, The 2nd receiving means which receives the print job data transmitted with said 1st transmitting means according to said 2nd protocol, A printing processing means to generate an image data based on the print job data received with said 2nd receiving means, It is the printer characterized by having a printing activation means to perform printing to a printing record medium, based on the image data generated with said printing processing means.
[0014] Here, said 1st transmitting means is characterized by transmitting said print job data using the loopback address specified by IP (Internet Protocol) known as a network protocol.
[0015] Moreover, said 1st transmitting means specifies a predetermined port, and transmits said print job data, and said 2nd receiving means is characterized by receiving in said specified predetermined port.
[0016] Furthermore, said predetermined port is characterized by differing from the port which said 1st receiving means receives, when said the 1st protocol and said 2nd protocol are the same.
[0017] As for said the 1st protocol and/or said 2nd protocol, it is desirable that it is the LPR protocol mounted on TCP/IP further again.
[0018] Moreover, said printer is characterized by having further a conversion means to change the print job data according to said 1st protocol into the print job data according to said 2nd protocol.
[0019] Invention of the above-mentioned equipment is materialized also as invention of an approach. That is, this invention is the transfer approach of the print job data in the printer equipped with the print server, and is the transfer approach of the print job data characterized by transmitting to a receiving means by which a transmitting means by which the print job data spooled to said print server were prepared at said print server side specified the loopback address specified by IP, and was formed in the printing processing means side.
[0020] Furthermore, this invention is materialized also as a record medium which recorded the program which realizes a predetermined function on the printer. This invention is more specifically the record medium which recorded the program which realizes a predetermined function on the printer. Said program The 1st reception function which receives the print job data transmitted from a host computer, The spool function which makes the print job data received by said 1st reception function spool to predetermined storage, The 1st transmitting function which transmits the print job data spooled to said store according to a predetermined protocol, The 2nd reception function which receives the print job data transmitted by said 1st transmitting function according to said predetermined protocol, The generation function which generates an image data based on the print job data received by said 2nd reception function, It is the record medium which recorded the program characterized by having the control function controlled to make printing to a printing record medium perform in a print engine based on the image data generated by said generation function.
[0021] Here, with said record medium, memory else [, such as a hard disk (HD), DVD-RAM a flexible disk (FD) and CD-ROM,], such as RAM and ROM, is included. Moreover, the so-called microcomputer which performs processing predetermined because the so-called central processing units, such as CPU and MPU, interpret a program as said printer is included.
[0022] Moreover, said program may be realized including the function to call the function realized by

basic programs, such as an operating system.
[0023] Furthermore, this invention may be constituted as a print system equipped with the above-mentioned printer and the computer.
[0024] In addition, in this specification, a means does not only mean a physical means, and also when software realizes the function which the means has, it contains. Moreover, even if the function which one means has is realized by two or more physical means, the function of two or more means may be realized by one physical means.
[0025]
[Embodiment of the Invention] Next, the gestalt of operation of this invention is explained, referring to a drawing.
[0026] Drawing 1 is drawing for explaining the outline of the print system concerning this operation gestalt. As shown in this drawing, it connects through the predetermined network N and the host computer 1 and the printer 2 constitute the print system. This drawing shows one set represented among two or more host computers 1 connected to Network N, and a printer 2, respectively. Network N is realized for example, according to Ethernet specification. A host computer 1 and a printer 2 mount the communication link interface 11 for realizing the network service according to TCP/IP which is a general-purpose network communication protocol. That is, the communication link interface 11 of this operation gestalt realizes communication service positioned in the lower layer protocol as used in the field of a network protocol hierarchical model. The IP address which is a network address of a proper is assigned to the host computer 1 and printer 2 which are grasped as a node on Network N, respectively. The communication link interface 11 is constituted by the various hardware and the various software for realizing TCP/IP service. The communication link interface 11 has the I/O Port (henceforth a "port") with which the number (for example, 0-65535) of a proper was assigned, and offers communication service through the port specified in packet data.
[0027] An application program 12 is a graphic editor which creates and edits the word processor for drawing up and editing a document, and a graphic form. If a printing command is now given through a user interface from a user, as for an application program 12, a printer driver (not shown) will be called. This printer driver receives that application data that is a candidate for printing from an application program 12, changes it into the print job data for interpreting this application data by the printer 2, and is outputted to LPR client 13A. LPR client 13A transmits the print job data sent from the printer driver to the printer 2 specified as the printout point according to a predetermined network communication protocol. That is, when a host computer 1 tends to make it print to the specific printer 2, the IP address currently assigned to the printer 2 will be specified, and it will transmit. In this case, LPR client 13A also specifies a phase hand's specific port. In communicating between LPR server 14A, it specifies No. 515 as a phase hand's port. LPR server 14A receives print job data from LPR client 13A, and outputs this to the print server body 15.
[0028] Typically, the print server body 15 is equipped with storage, such as a hard disk drive unit for spooling the print job data inputted, and is constituted. The print server body 15 manages the job demand based on the input of one or more print job data, and has the function to send out every one of it in order to the printing processing circuit 16. It becomes possible to receive two or more print job data (printing demand) from a host computer 1, and to process that printing demand one by one regardless of the situation of printing processing, with this print server body 15. The send of the print job data from the print server body 15 to the printing processing circuit 16 is performed through LPR client 13B and LPR server 14B. This LPR client 13B and LPR server 14B are also mounted on TCP/IP. Therefore, LPR client 13B communicates by specifying a specific port and a specific specific IP address. Here, the IP address which LPR client 13B specifies as a transmission place is a loopback address. Moreover, a specific port is No. 8515.
[0029] The printing processing circuit 16 is for interpreting the print job data received from LPR server 13B, generating an image data, and supplying this to the print engine 17. Typically, the printing processing circuit 16 consists of RAM which memorizes the image data which was used as a work area of ROM which recorded the interpreter program and font data for interpreting print job data, the

processor which performs an interpreter program and develops print job data to an image data, and a processor, and was developed. If the image data of a predetermined bandwidth is developed, the printing processing circuit 16 will output a printing demand signal to the print engine 17, and will output an image data to the print engine 17 according to the synchronizing signal sent from the print engine 17.
[0030] The print engine 17 is constituted by carriage, the print head, etc., and prints to printing record media, such as paper. The thing according to the class of printers, such as a laser beam printer and a serial printer, can be used for the print engine 38.
[0031] LPR client 13A and B which were mentioned above and LPR server 14A, and B are the programs for realizing communication service positioned in the upper layer protocol as used in the field of a network hierarchical model. the LPR client 13 -- A, B, and the LPR server 14 -- if A and B are performed as the so-called demon program and a predetermined event is received, they will perform the communications processing according to a predetermined network communication protocol.
[0032] The LPR client 13 is sent out to Network N through a low-ranking communication service means (this operation gestalt communication link interface 11), changing physically and logically the data which should specify a transmitting phase hand's IP address and port, and should be transmitted. If the packet data addressed to self which flow Network N top are received, to the port specified by the received data, the communication link interface 11 will change the data physically and logically, and will deliver it to the communication service means of a high order. The LPR server 14 is set up so that it may communicate through the specified port. As for LPR server 14A in this operation gestalt, the port of No. 515 is specified. Therefore, when the communication link interface 11 is data with which No. 515 was specified, it will be delivered to LPR server 14A.
[0033] As mentioned above, LPR client 13B specifies a loopback address as an IP address, and sends out print job data. A loopback address is the address used for transmission for itself. In IPv4, a loopback address is expressed as "127.0.0.1" and expressed as "0:0:0:0:0:0:127.0.0.1" in the IPv4 compatible format of IPv6. Moreover, as a phase hand port, LPR client 13B is set up so that No. 8515 may be specified. LPR server 14B is set up so that it may communicate through the port (that is, this example No. 8515) specified by LPR client 13B. Therefore, when the communication link interface 11 receives the data with which No. 8515 was specified, it will be delivered to LPR server 14B.
[0034] Next, the example of the print system constituted as mentioned above of operation is explained. Here, an IP address "161.141.22.5" shall be assigned to a host computer 1, and "163.141.22.5" shall be assigned to the printer 2. Moreover, a port number 515 shall be assigned to LPR server 14A, and the port number 8515 shall be assigned to LPR server 14B.
[0035] Now, a host computer 1 shall transmit a printing demand (print job data) to a printer 2. A host computer 1 specifies and sends out the destination IP address "163.141.22.5" of IP header while specifying the destination port number 515 of the TCP header of data which should transmit. In addition, any value other than the port number (1024 or more) by which the transmitting agency port number is reserved typically is assigned dynamically. Drawing 2 (a) is drawing showing the structure of the data transmitted to a printer 2 from a host computer 1. If a printing demand is received through a network environment from a host computer 1, a printer 2 will be sent out to the printing processing circuit 16 one by one according to a printing processing situation, once it spools this to the print server body 15. As for a destination port number, 8515 is specified while, as for the destination IP address of IP header, a loopback address "127.0.0.1" is specified at this time. Drawing 2 (b) is drawing showing the structure of the data transmitted to the printing processing circuit 16 from the print server body 15. By this, it will act as the loop back of the data transmitted to the printing processing circuit 16 from the print server body 15 within IP layer, and they will be received and passed to the printing processing circuit 16 through LPR server 14B from a port number 8515.
[0036] Since it is and is received made to transmit data based on TCP/IP which is a standard network technique according to an LPR client/server according to this operation gestalt as mentioned above, it becomes unnecessary to dare develop an interface part until it reaches [from a print server body] a printing processing circuit, and development cost can be held down low. For example, even if it is the case where LAN is built with network protocols other than TCP/IP, if a standard LPR service program is

used for an interface part until it reaches [from a print server body] a printing processing circuit, it will be sufficient for it. In this case, what is necessary is just to perform conversion to an LPR protocol from various network protocols by the module in a print server. If it puts in another way, it is not necessary to newly develop the interface according to various network protocols, and what is necessary will be just to offer the conversion program of n pair LPR to n protocols.

[0037] Although the protocol (the 1st protocol) for transmitting to the print server body 15 from a host computer 1 and the protocol (the 2nd protocol) for transmitting to the printing processing circuit 16 from the print server body 15 explained print job data with the above-mentioned operation gestalt as what is both LPR protocols, it is not necessary to adhere to especially this.

[0038] For example, you may make it 2nd client 13A (for it to be equivalent to the LPR client of drawing 1 .) of a host computer 1 transmit print job data to 2nd server 14B (for it to be equivalent to the LPR server of drawing 1 .) prepared in the printing processing circuit 16 side directly, as shown in drawing 3 .

[0039] The above-mentioned operation gestalt is the instantiation for explaining this invention, and is not the meaning which limits this invention only to this operation gestalt. This invention can be carried out with various gestalten, unless it deviates from the summary. For example, although actuation of the above-mentioned functional implementation means was explained sequentially, it does not adhere to especially this. Therefore, unless conflict arises in actuation, you may constitute so that parallel operation of the sequence of processing may be replaced or carried out. Moreover, you may be IPv6 although this operation gestalt explained based on IPv4.

[0040]

[Effect of the Invention] According to this invention, it becomes unnecessary to develop an interface for every model of printer, and development cost can be held down now very low.

[Translation done.]